

Math 261B Design and Analysis of Experiments

TR 12pm – 1:15pm, MQH 323, *San Jose State University*, Spring 2017

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Office hours: 10:30am-11:45am TR & by appointment

Textbook: Design and Analysis of Experiments, 8th edition, 2012, Montgomery, Wiley, ISBN-13: 978-1118146927.

CANVAS: Homework/test scores and course-related documents are all posted in this site; please check regularly and let me know ASAP if there is any error in your record.

Course topics

One- and two-factor ANOVA; fixed and random effects, interaction effects, randomized blocks, factorial, nested and other designs; repeated measures, ANCOVA, chi-square test, logistic regression, non-parametric regression such as classification and regression trees (CART), as well as diagnostics and model comparison.

Software

Use of software is an integral part of this course. We will rely on R to perform all computing tasks; it is freely available at <http://cran.r-project.org/>. You should also have a basic calculator for homework and exams.

Prerequisites

Math 261A (with grade B or better), Math 164. Math 164 may be taken concurrently (so you must have passed Math 163). Some previous exposure to R is also expected.

Learning objectives

- Identifying the appropriate statistical model for a given experimental procedure.
- Assuring the validity of assumptions for a given model for a specific data set.
- Phrasing and testing meaningful hypotheses for linear models.
- Analyzing data using statistical software and formulating conclusions in the appropriate context of the problem.

Course requirements and assignments

Weekly homework assignments, with their due dates, will be regularly posted on Canvas. Some assignments may involve intensive programming; instructions will be given then.

There will be two in-class midterm exams and a final exam (all in this classroom):

- **Midterm exam 1:** Tuesday, March 7 (tentative date, to be confirmed).
- **Midterm exam 2:** Thursday, April 20 (tentative date, to be confirmed).
- **Final exam** (comprehensive): Wednesday, May 24, 9:45am-noon (fixed).

The midterm exams are both closed-book and closed-notes but you may bring a one-sided cheat sheet to the final. Before each test, a review sheet will be provided for you to, but the exams will be lecture-based.

The scales used in this course will be as follows:

- Homework: 40 (20%)
- Midterm 1: 40 (20%)
- Midterm 2: 50 (25%)
- Final: 70 (35%)

Thus, the maximum possible total score is 200.

Grading information

You may collaborate on homework but you must write independent solutions. Identical work will be treated as cheating and will result in a zero score for the homework (minimal penalty), and is subject to additional disciplinary actions from the University.

Late homework will not be accepted, but your lowest score will be dropped. Although many problems will be assigned, only a representative sampling will actually be graded. Since you will not know in advance which questions will be graded, it is in your best interest to do all of the assigned problems.

No make-up exams will be given if you miss a midterm exam. If you have a legitimate excuse (e.g., illness or other personal emergencies), *with documented proof*, the weight of the exam will be incorporated into the final (i.e. your final will be counted 60% of your course grade).

You must show all your work for both homework and tests. Note that it is your work (in terms of correctness, completeness, and clarity), not just your answer, that is graded. Thus, correct answers with no or poorly written supporting steps may receive very little credit.

I *expect* to use the following cutoffs for assigning your course grade (I may slightly adjust these percentages in order to better reflect the actual distribution of the class in the end):

- A+: >96%, A: 93-96%, A-: 90-93%
- B+: 85-89%, B: 80-84%, B-: 75-79%
- C+: 70-74%, C: 65-69%, C-: 60-64%
- D: 55-59%, F: <55%

Potential challenges

I expect that some people may have difficulty with some or all of the following:

- Proofs (we will try to prove a considerable portion of the theoretical results)
- Programming (familiarity with R is necessary for doing the homework)
- English (terminology and the wording of some examples may cause trouble)

Your responsibilities in learning

This is a graduate level course, and thus appropriate mathematical maturity and self-motivation is expected.

My duty as an instructor is to *disseminate knowledge* while being a *facilitator* to assist you learn in all possible ways. The ultimate responsibility of learning is upon the student, not on the instructor.

You must be an *active learner*, which means that you should

- Attend all classes
- Come to my office hours
- Participate in-class discussions
- Read the textbook
- Take time to think through the concepts
- Do your homework, and
- Ask whenever you don't understand something!!!

Overall, you are expected to spend **6+ hours** outside class time per week on this course.

Classroom protocol

- The class starts on time, so do not be late.
- If you miss a class, you are responsible for finding out what's said/done in that class (such as new announcement, deadline change, etc.) and responding accordingly.
- Please make sure to turn off or mute your cell phone during class.
- Please do not perform irrelevant or distracting activities in class.
- Academic dishonesty at any level is not tolerated and will be surely reported.

University policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' Syllabus Information web page at <http://www.sjsu.edu/gup/syllabusinfo/>”

Instructor feedback

I strive to teach in the best ways to facilitate your learning. To achieve this goal, it is very helpful for me to receive timely feedback from you. An anonymous midterm survey will be conducted right after the first midterm exam. Meanwhile, you may use this google form: <http://goo.gl/forms/f0wUD5aZSK> to submit your immediate feedback anonymously.

The instructor reserves the final right to interpret and make changes to the class policies and schedule that are stated in this course syllabus.